

CHAPTER 6

TAXIWAY LIGHTING SYSTEMS

6-1. Taxiway lighting description

A taxiway lighting system at an Army airfield is a configuration of lighting fixtures which define the lateral limits and direction of a "taxiing route." The configuration will normally consist of a line of aviation blue lights paralleling each side of the taxiway. The lights are denoted as taxiway edge lights. In addition, the entrance and exit points of a taxiway will be distinctly lighted. At Army heliports and helipads, taxiway lighting criteria will vary slightly from that for airfields, and will be as described below for the type of facility provided.

6-2. Criteria for taxiway lighting

Taxiway lighting will be provided for all regularly used "taxiing routes." Where a runway or a portion of a runway is part of a regularly used taxiing route, taxiway lights may be provided in addition to the runway lights. Taxiway lights will be served from a taxiway lighting circuit and not from a circuit serving the runway lights. For a taxiway adjacent to or part of an apron, taxiway edge lights normally will be provided on only that side of the taxiway farthest from the apron. Taxiing routes through an apron will not be provided with taxiway edge lights.

6-3. Lighting configurations

a. Airfield taxiway lighting. The line of taxiway edge lights on each side of the taxiway will be no farther than 10 feet from the edge of the full strength paving and no closer to the full strength runway paving than the runway edge lights. The line of taxiway lights on both sides of the taxiway will be equidistant from their respective taxiway sides.

(1) Straight sections of taxiways. On straight sections of taxiways, the longitudinal spacing may approach, but not exceed 200 feet, and will be substantially uniform, except as required below. The longitudinal spacing of the pairs of lights will be calculated from the nearest point of tangency (PT) of the fillet, curve, or corner at one end of the section to the nearest PT, curve, or corner at the other end of the section. Beginning at the PT or corner, each pair of lights marking opposite sides of a taxiway will be at right angles to the taxiway centerline.

(a) An additional pair of lights should be installed between the lights at the PT and the first pair of lights on the straight section of a taxiway. These additional lights will be placed at a distance approaching, but not exceeding, 50 feet from the PT (fig 6-1). This provision is not applicable to sections of taxiways less than 200 feet in length.

(b) On straight sections of taxiways less than 200 feet in length as measured from PT or corner to PT or corner,

closer spacing of pairs of lights will be utilized. This spacing normally will approximate 50 feet and in no case exceed 100 feet (fig 6-2).

(2) Single straight edges of taxiways. Where it is practicable to light only one straight edge of taxiway section, the longitudinal spacing of the lights may approach, but not exceed 100 feet. The lights will be uniformly spaced between the PTs or corners, or between the opposite PTs or corners, as applicable (fig 6-3). An additional light will be installed between the light at the PT and the first light from the PT at a distance approaching, but not exceeding, 50 feet (fig 6-3). Where the straight edge of the taxiway is less than 200 feet in length as measured from PT or corner to PT or corner, the spacing of the lights will not exceed 50 feet (fig 6-4).

(3) Spacing on curved edges of taxiways. The spacing of lights on curved edges of taxiways will be uniform and will not exceed the values determined from the table in figure 6-5. On all curves in excess of 30 degrees of arc, there will be not less than three light locations, including the PTs.

(4) Entrance-exit points. Entrance and exit points will be marked by means of blue taxiway (taxi guidance) lights or yellow entrance and exit signs. The taxi guidance lights normally will be used. Entrance and exit signs will be used only where specifically directed or approved for installation. Entrance and exit signs (movement area guidance signs) will not be used at intersections of taxiways with other taxiways.

(a) At intersections of taxiways with runways or aprons, taxi guidance lights serving as entrance and exit lights will be placed at the PTs of the taxiway and the runway or apron. These lights will be located at right angles to the paved edge of the taxiway runway, or apron, approximately 5 feet from the runway lights at these points. The pair of entrance and exit lights will be offset from the row of runway lights in order to produce minimum visual interference between entrance and exit lights and runway lights. The lighting configuration for taxiways with adjoining engine run up areas will be in accordance with typical layouts as shown in figure 2-1.

(b) Where directed or approved for installation, intersections of taxiways with runways will have lighted signs except where such signs would interfere with aircraft operations, in which case taxi guidance lights will be installed. Entrance and exit signs will be placed at the PT of the taxiway and the runway or apron, and not more than 20 feet from the edge of the full strength taxiway, runway, or apron pavement. Faces of the signs will be substantially at right angles to the adjacent runway or apron edge to achieve the best legibility. Lighted signs will be used in lieu of taxi guidance lights at these points. The nearest edge of each entrance and exit sign will be located a minimum of three

feet outside the row of runway lights in order to present minimum visual interference between the sign and the runway lights (fig. 6-6). When entrance and exit signs are used where taxiways join runways, the sign faces will show the word "EXIT" plus a small directional or plain arrow turned toward the taxiway fillet. The reverse face of each sign will show a legend which will designate and identify the particular taxiway, such as the legend "TAXI F" or a plain arrow and a capital letter, designating the sequence of the turn-off from the end of the runway. When entrance and exit signs are used where taxiways leave aprons, the signs will show the appropriate designation and/or identification legends. For detailed information covering the specification requirements for internally lighted entrance and exit signs, reference should be made to FAA Advisory Circular AC 150/5345-44, Specification for Taxiway and Runway Signs.

(5) *Color and characteristics.* Taxiway lights, including entrance and exit light, will emit aviation blue light. The entrance and exit signs will emit aviation yellow light. The taxiway lights (steady burning) will be fixed lights and elevated, except where they would interfere with aircraft operations. In the latter case they should be semiflush type. The intensity of the taxiway lights will provide adequate taxiing guidance for all meteorological conditions under which the system is used. Brightness control may be provided only when specifically authorized and specified for the taxiway light installation.

(6) *Location, height, and frangibility.* These factors will be applied to taxiway lighting installations in such manner that the installation does not interfere with normal aircraft operations.

(a) The lines of taxiway lights will be located not more than 10 feet from the edge of the designated full strength taxiway paving. Entrance and exit lights will be offset from the rows of runway lights to present minimum visual interference between the entrance and exit lights and the way lights as shown in figure 6-7. Entrance and exit signs will be located not more than 20 feet from the runway, taxiway, or apron edge.

(b) The height of the taxiway lights will be not more than 14 inches above the adjacent paved surfaces, but raised to an overall height of 30 inches to meet local requirements where the location does not interfere with normal aircraft operations. Entrance and exit signs will not project more than 30 inches above the nearest edge of the adjacent taxiway.

(c) All elevated taxiway lights will be either frangible or mounted on frangible fittings. Entrance and exit signs may be frangible, but will be mounted on frangible fittings.

(7) *Portion of a runway used as a taxiway.* Where a portion of a runway is normally used as a taxiway to the runway in use, taxiway lighting will be installed on that portion of the runway (fig 6-8). Taxiway lights on a portion of a runway will be installed in addition to, and outside of, the line(s) of runway lights.

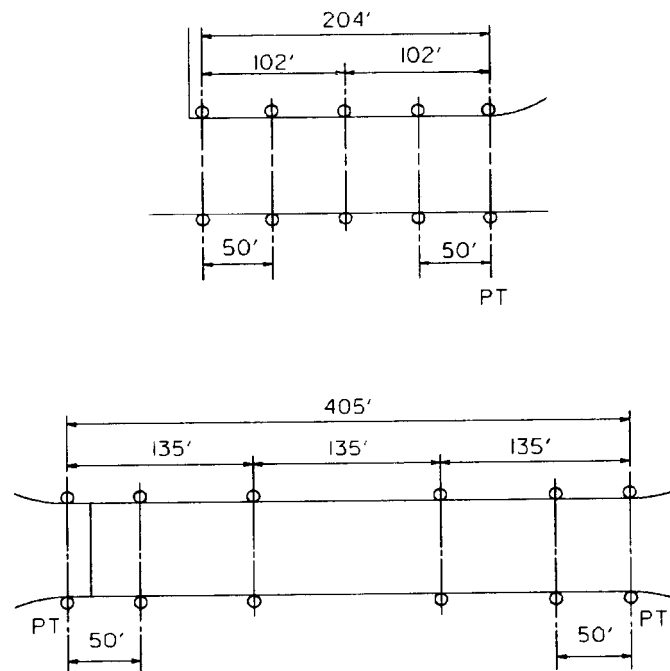


Figure 6-1. Typical examples straight sections- more than 200 feet.

b. Heliport taxiway lighting. The taxiway lighting system will consist of a line of elevated and/or semiflush taxi guidance lights on each side of the taxiway, defining the lateral limits and direction of the taxiway. Taxiway lights will not be installed in those sections where surfaced aprons adjoin the taxiway. Brightness control ordinarily will be provided for the heliport taxiway lighting system.

(1) *Straight sections of taxiways.* On straight sections of taxiways, the pairs of lights will be uniformly spaced on centers of approximately 40 feet, but not less than 35 feet nor more than 45 feet. The longitudinal spacing of the pairs of lights will be calculated from the nearest PT of the fillet, curve, or corner at one end of the section to the nearest PT of the fillet, curve, or corner at the other end of the section. Companion lights on opposite sides of the taxiway will be located on lines perpendicular to the centerline of the taxiway. Where it is practicable to light only one straight edge of a taxiway section, the lights will be uniformly spaced between the PTs, or corners, or between points opposite the PTs or corners, as applicable. This spacing will be approximately 40 feet, but not less than 35 feet nor more than 45 feet. Semiflush lights will be used as taxiway lights in the engine run up area.

(2) *Curved sections of taxiways.* On curved sections of taxiways at heliports, taxiway lights will be uniformly spaced on lines radial from the center of the curves. The

spacing will be uniform and will be determined by the radius of the applicable curved edge of the taxiway. The taxiway lights will be spaced approximately 13 feet apart on the periphery of the curve, but not less than 10 feet nor more than 16 feet apart, except that no curve will have less than three light locations including those at the PTs. For example: For radii of 15, 25, 30, 40, and 50 feet, the number of lights required would be 3, 5, 6, and 7, respectively, and the light spacing would be approximately 13 feet up to a 40-foot radius and approximately 16 feet for a 50-foot radius. At intersections of taxiways with runways or aprons, taxi guidance lights serving as entrance and exit lights will be placed at the PTs of the taxiway and the runway or apron. These lights will be placed at right angles to the paved edge of the taxiway, runway, or apron, approximately 5 feet from the taxiway lights at these points. The pair of entrance and exit lights will be offset from the rows of runway lights in order to present minimum visual interference between the entrance and exit taxiway lights and the runway lights.

(3) *Intersections.* Where taxiways intersect runways, aprons, or other taxiways, a close uniform spacing of taxiway lights as determined by the appropriate layout criteria cited above will be used along the pavement fillet on each side. Close spacing will extend from fillet PT to PT. When the intersection is not at right angles, close spacing

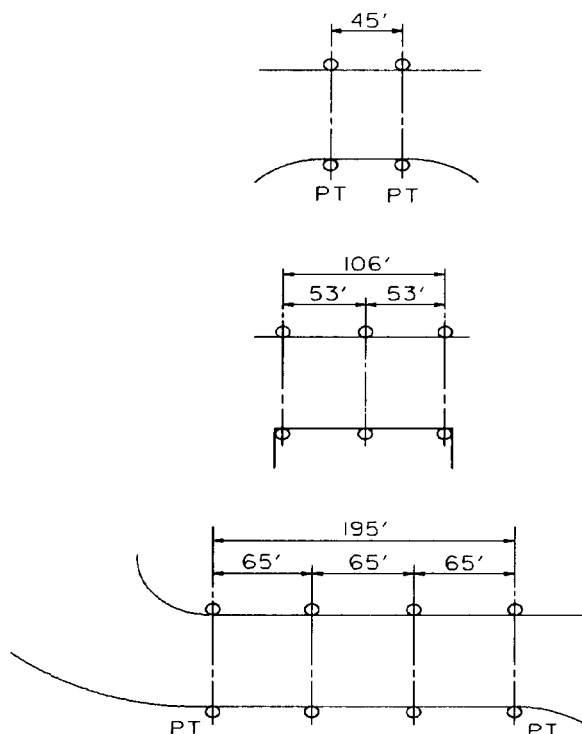


Figure 6-2. Typical examples straight sections-less than 200 feet.

will be continued from the PT of the fillet on one side of the taxiway to the PT on the other side of the taxiway. The pair of entrance and exit lights will be on a line at right angles to the pavement edge, and the nearest entrance and exit light not more than 10 feet from the pavement edge.

(4) *Entrance and exit signs.* If entrance and exit signs are specifically directed or approved for installation, the criteria should be as described in a(4), a(S), and a(6) above.

(5) *Runway used as a taxiway.* Where the runway is used as a taxiway to the runway in use, the taxiway lighting will be installed as described in runway lighting system.

c. *Helipad taxiway lighting.* Taxiway lighting for helicopter operation from helipads will be provided as for taxiways at heliports; taxilanes which are used for combination fixed-wing and rotary-wing operation; and hoverlanes which are taxiing routes for aircraft maneuvering in hover attitude along the taxiing route to and from the helipad and the apron areas.

(1) Taxiway lighting systems will be as described in heliport taxiway lighting.

(2) Taxilane lighting systems will consist of a row of elevated blue taxi guidance lights on each side of the taxilane. One side will be airfield taxiway lighting as described in airfield taxiway lighting. The opposite side of the taxilane will have lights opposite the taxiway lights required above, and additional lights located on equal spaces between these lights. The spacing of these additional lights normally will be 40 feet between lights, but not less than 35 feet nor more than 45 feet.

(3) Hoverlane lighting systems installed on load-bearing surfaces will consist of a single row of semiflush alternating aviation green and yellow taxiway light fixtures located along the centerline of the hoverlane. When lighting system is installed on nonload-bearing surfaces, elevated fixtures will be installed instead of semiflush. These fixtures will be spaced nominally 50 feet on center for long straight sections, and mounted on metal light base fittings. For curves, fixtures will be spaced nominally 25 feet on centers. When hoverlanes terminate adjacent to hanger access aprons or boundaries of other areas not intended for own-power operation, the desirable limit of helicopter travel along hoverlanes toward such areas will be indicated by three lighting fixtures emitting aviation red light. Two red hoverlane limit lights will each be installed on opposite sides of, and approximately 15 feet from, the hoverlane centerline. The third light, forming a line of three such lights perpendicular to the alternating aviation green and yellow hoverlane lights, will be located in line with the alternating aviation green and yellow hoverlane lights. Red hoverlane limit lights will provide unidirectional guidance by use of a combat-type hood attached to a taxiway light fitting. The row of alternating aviation green and yellow hoverlane lights described above will terminate approximately 25 feet from the red limit lights, outward from the apron or boundary. Hoverlane limit light mountings and types will be as for the alternating aviation green and yellow hoverlane lights described above. Hoverlane turnoffs to individual parking pads will be indicated by a aviation green and

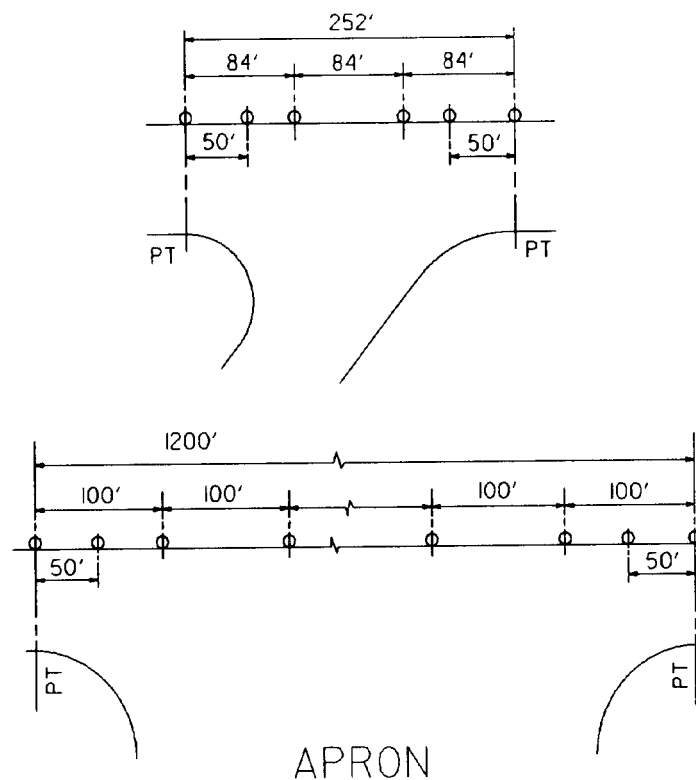


Figure 6-3. Typical examples single straight sides-more than 200 feet.

yellow hoverlane lights beginning approximately 25 feet from and perpendicular to the hover-lane, installed on nominal 25-foot centers. The line of hoverlane turnoff lights will terminate approximately 25 feet from the edge of the parking pad nearest the hover-lane. The limit of helicopter travel from the hoverlane toward the pad, along the turnoff, will be indicated by two parking pad limit lights, which will be located approximately 20 feet beyond the pad, 15 feet apart, perpendicular to the turnoff light line. Parking pad limit lights will emit aviation red light, and will provide unidirectional guidance with a combat-type hood, attached to a taxiway light fitting with red lens. All hoverlane limit and parking pad limit lights will be provided with brightness control and circuited separately, as a group, from other lights. Hoverlane lighting will not be installed in the rigid pavement area of mass parking aprons. On curved sections of hoverlanes, the criteria as described in b(2) above will apply.

6-4. Lighting equipment for taxiways

Taxiway (taxi guidance) lights will have a symmetrical photometric distribution of aviation blue light; except that hoverlane limit and parking pad limit lights will emit aviation red light. Normally these lights will be of the elevated type. However, where interference with aircraft movement may occur, semiflush lights will be installed. The electrical energy to these lights will be supplied by series circuits, through regulators as described in chapter 10. The lights

will be mounted in concrete bases as shown on the Installation Detail Drawings. Lights as described below are identified by a descriptive name, USAF Item Number and, where existing, by Part Number or Military Standard or Military Specification. Mounting accessories are not noted below, but are shown on the Installation Detail Drawings.

a. *Elevated taxiway lights.* Elevated taxiway (taxi guidance) lights will be by type M-1, Item No.294, conforming to Mil. Spec. MIL-L-7082. The lamp will be 30 watts, 6.6-ampere, T-10 medium pre focus base, Item No.334, conforming to Mil. Std. MS 25012-1 and Mil. Spec. MIL-L-6363. The blue lens will be Item No.324, and the red lens will be Item No.337, both conforming to Mil. Spec. MIL-L-7082.

b. *Semiflush taxiway lights.* Semiflush taxiway lights will be class B-3, Item No.653, conforming to Mil. Std. MS 27033 and Mil. Spec. MIL-L-26202. The lamp will be 45 watts, 6.6-ampere, PAR 56, Item No.577, conforming to Mil. Std. MS 24488 and Mil. Spec. MIL-L-6363. The filter will be blue, or red, as required above, suitable for use with the class B-3 fixture, and conforming to Mil. Std. MS 24502 and Mil. Spec. MIL-L-26202.

c. *Taxiway light hoods.* Air Force-type light directional control hoods on the elevated light fixtures, sometimes used in connection with taxiway lighting (including elevated entrance and exit lights) at Air Force Bases, normally will

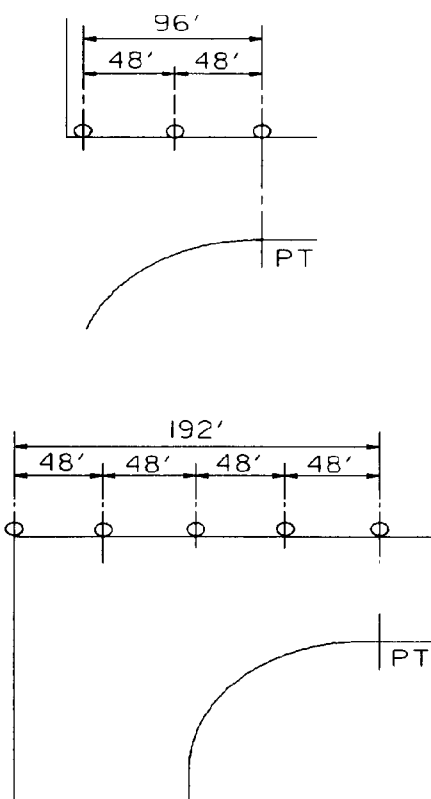


Figure 6-4. Typical examples single straight edge-less than 200 feet.

not be used unless authorized.

6-5. Power supply and circuits

Energy for taxiway lights (including taxilanes and hoverlanes) will be supplied from 6.6-ampere series circuits, with each circuit served from a low voltage regulator located in the equipment vault. Brightness control for taxiways at helipads will be determined on the basis of operational need. At heliports, taxiway lights will have brightness control. At airfields, brightness control normally will not be a part of the system. Regulators will be as described in chapter 10.

a. *Circuiting criteria.* The edge lights and entrance and exit lights for a taxiing route will be supplied from one circuit, if feasible. A taxiing route normally will be from one runway end to the other end of the same runway or to some terminal area, such as an apron. A section of the taxiing route will not be supplied from a separate circuit unless

justified for operational or engineering considerations. For exceptionally long taxiing routes, more than one regulator may be required. Where this occurs, the load should be divided equally between the regulators. Regulators should always be loaded to at least one half of rated kW output. However, where extensions to the taxiing routes are contemplated, exceptions to the above may be made. The criteria above shall also be used for circuiting the centerline lighting of hoverlanes.

b. *Transformers, cables and connectors.* For information on the installation of these items see chapter 8.

(1) The cable used for the series circuits will be No. 8 AWG, 1/C stranded, 5,000 volt, cross-linked polyethylene, conforming to Mil. Spec. MIL-C-38359.

(2) The series transformers for the lighting systems (taxiways, taxilanes, and hoverlanes) will be 6.6/6.6 amperes

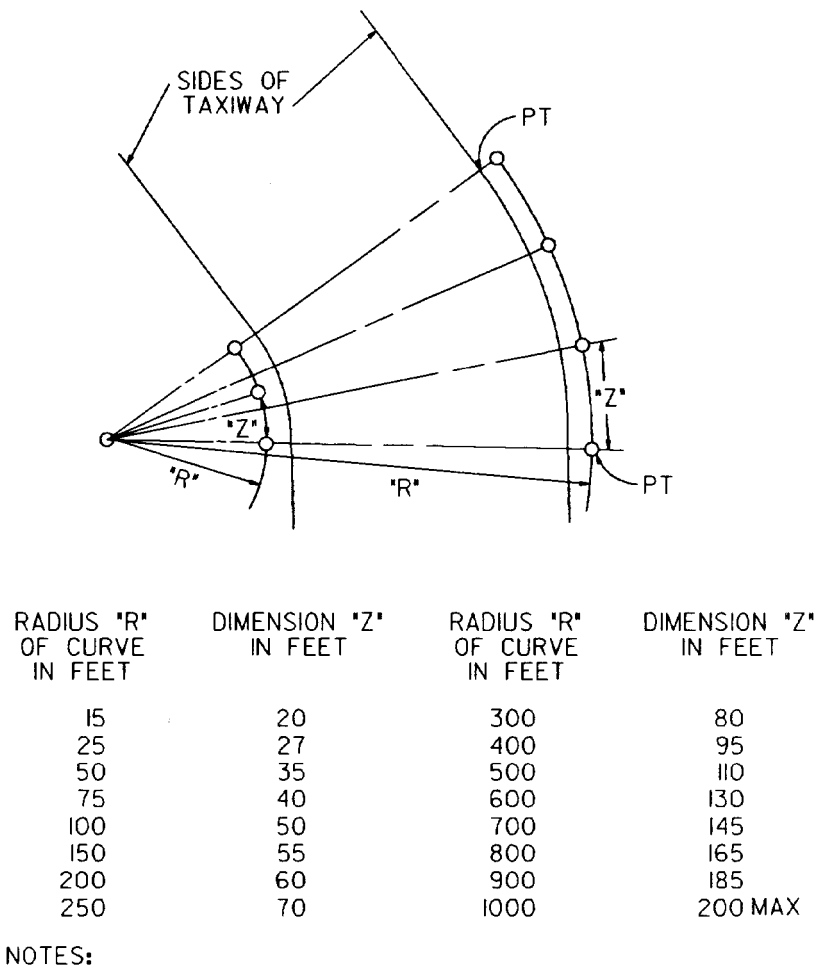


Figure 6-5. Spacing of lights on curve edges.

30/45 watts, Item No. 829 conforming to Mil. Spec. MILT-27535 and Mil. Std. MS 27289.

6-6. Taxiway lighting control system

The taxiing route lighting control systems are an integral part of the overall control system for all airfield, heliport,

and helipad lighting facilities. The function of this portion of the control system is to energize and deenergize selected taxiing routes. The system normally will be controlled from the control tower and equipment vault unless otherwise indicated, and will be as described in chapter 10.

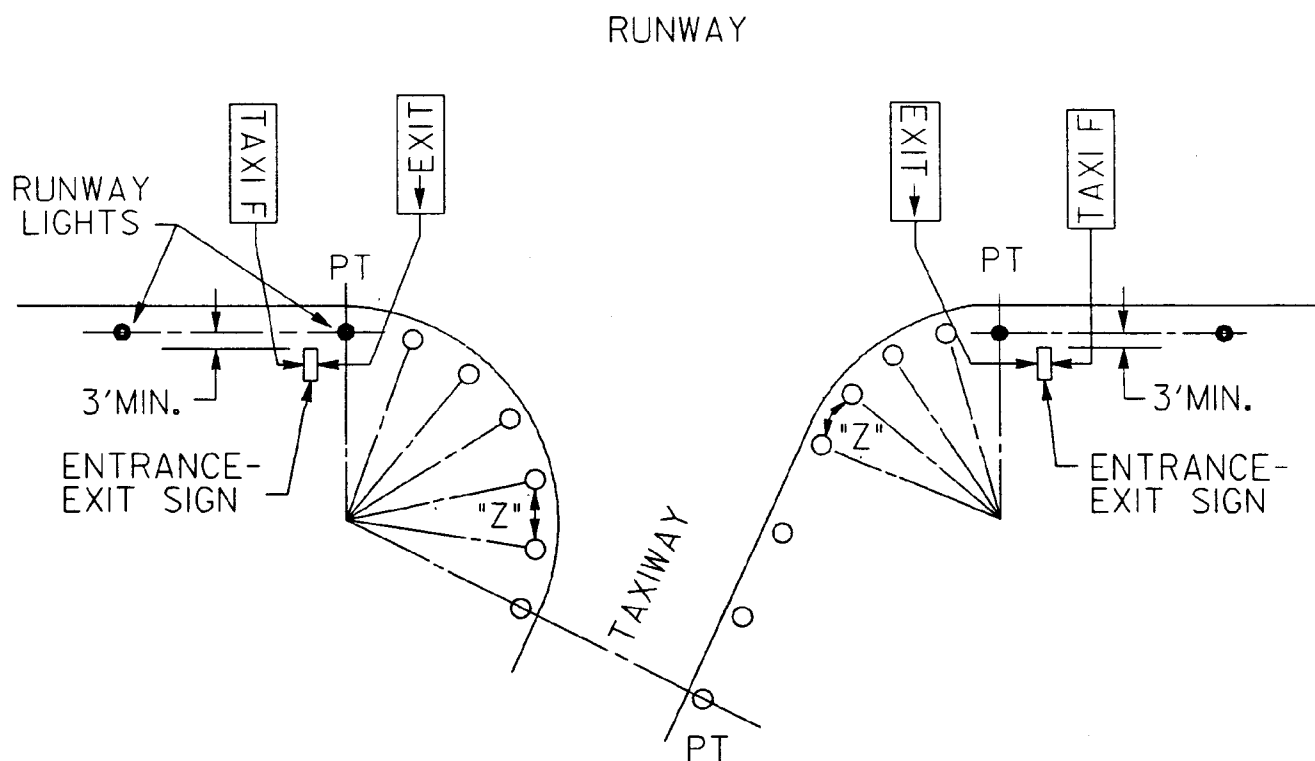


Figure 6.6 Location of entrance and exit signs.

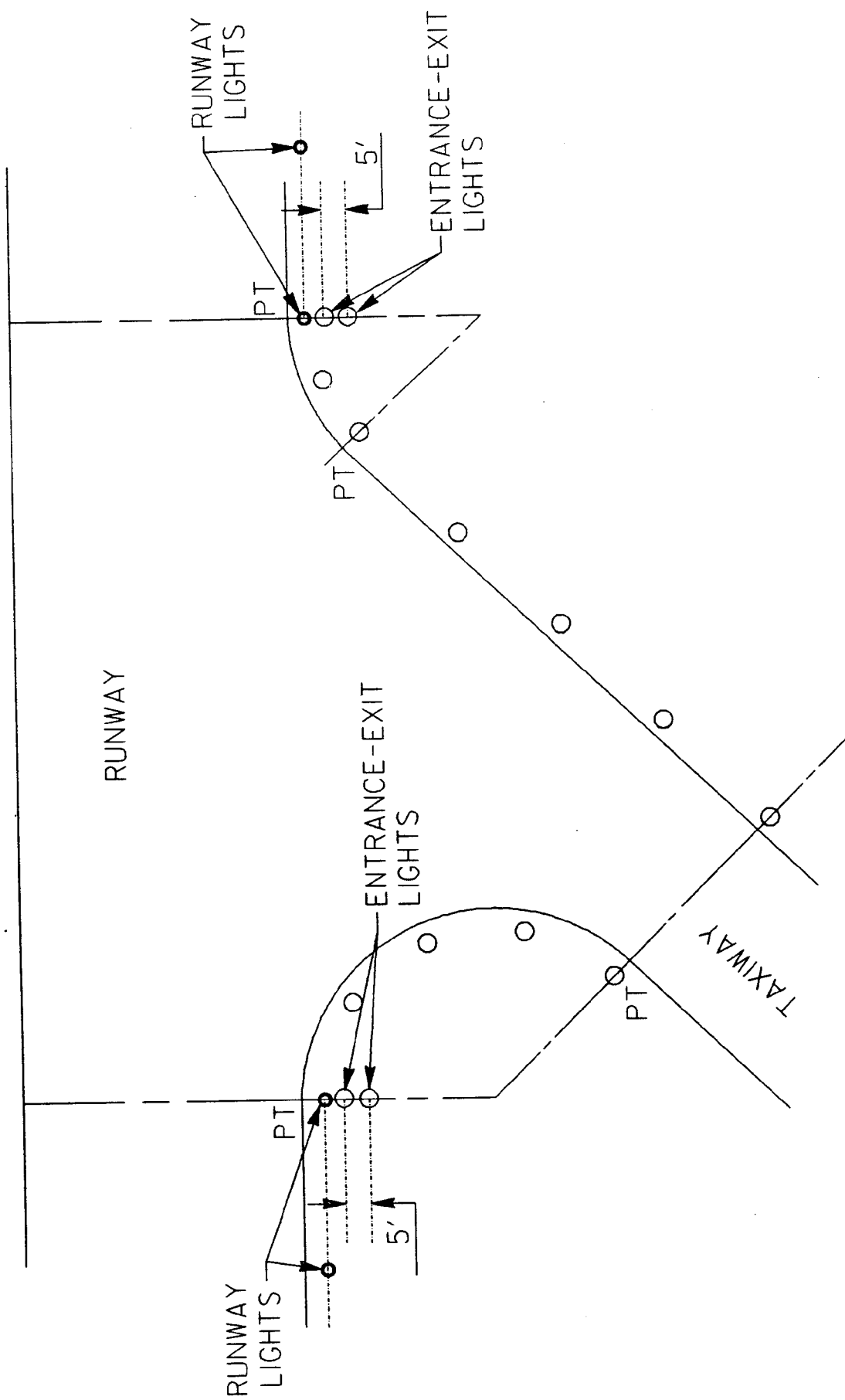


Figure 6-7. Location of entrance and exit lights.

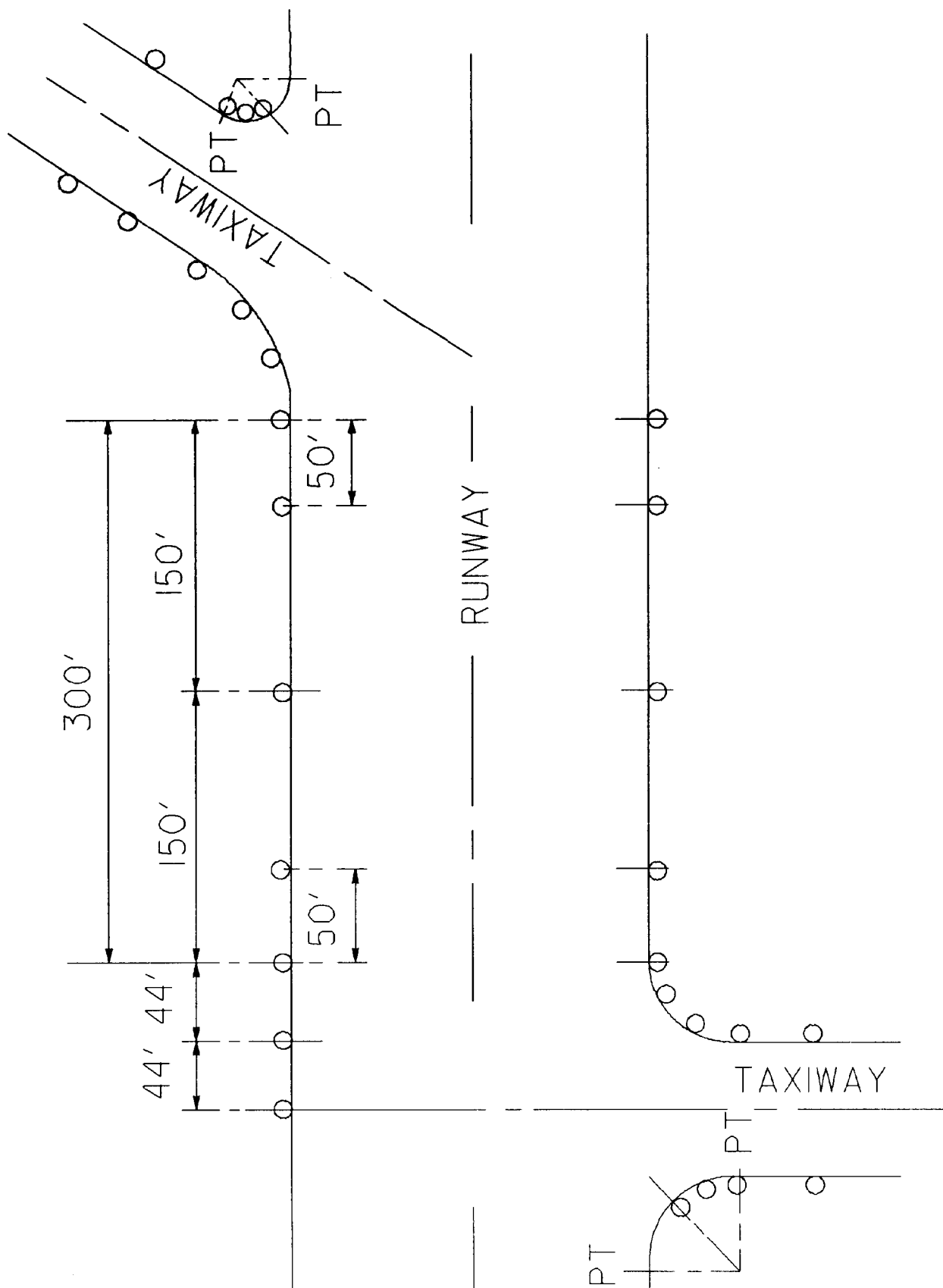


Figure 6-8. Typical example portion of runway used as taxiway.